Statement of Work for

Human Factors Simulator Lab Integrated Data Recording and Analysis System

Prepared by:

Human Factors Research Branch
Civil Aerospace Medical Institute
Federal Aviation Administration
Oklahoma City, OK 73125

Project Title

Digital Recording Integration

1.0 Background

This Statement of Work (SOW) includes background information about data acquisition and analysis system in the CAMI Aerospace Human Factors Research Division of the General Aviation Flight Simulators lab in Oklahoma City.

Currently, a variety of human factors related studies are conducted on three flight simulators, the equipment being used to record data include video, audio, digital telemetry and computers that record flight data and cockpit information. Currently, data collection occurs in several formats and may or many not have a synchronized time stamp. The lab does not have the ability to time stamp all recorded data or synchronize it together for analysis. After the subject has completed their session in the study, the video and audio data is stored on either DVD or VCR and the computer data is stored on computer hard drives.

Presently, the research scientist must use several pieces of equipment and methods to analyze all the data. These include DVD Player/or a VCR player and a personal computer to analyze data. There currently is no ability to simultaneous analyze the various forms of data.

2.0 Scope

The goal of this effort is to create a user-centered application that will take multiple data streams and synchronize them into a single source of information that can be archived to a single storage solution, and later played back for viewing and analyses. This application will reduce the time required by researchers in evaluate and analyzing test data currently being collected during a typically study. Additionally, the system will allow for future growth requirements of additionally data streams.

3.0 Requirements

3.1 System

The Human Factors Department of the FAA in Oklahoma City desires a digital data recording system that will record, time stamp and convert all separate forms of recorded data into a single integrated digital data environment which can then be archived to one media format so it can be analyzed on a personal computer with a Microsoft Windows Operating System. Additionally, the system should not require any special training or extensive learning curve for the user (researcher, technician, psychologist and external or outsourced personnel).

3.2 Recording

The new Data Recording System must be able to record multiple lossless data channels including high-speed analog, voice, video, digital flight data and digital telemetry. All data streams will be time based synchronized and linked during recording and playback. All digital data needs to be recorded to and reproduced from a high capacity storage solution (hard disks) with the ability to archive to and restore from standard computer peripherals such as DVD, Blue-Ray DVD, USB Drive or other common forms of computer media storage. A minimum of 8 channels will need to be initially provided with the capability of infinite expansion. It is also required that there will be no degradation of bandwidth as channels increase.

3.3 Playback

A Full graphical replay tool shall be provided for digital replay and flexible analysis of data. The system must give users the ability to analyze the data on PC computers with Microsoft Windows Operating System. The user should be able to pull up several windows at the same time, each with a separate recorded data stream. The user shall be able to playback the synchronized data streams at variable speeds backwards and forwards. The user shall have the ability to link the windows together and link the streams together to the same timer stamp. This will give the user the ability to monitor and drive several windows of data streams together while running them back and forth.

The software shall give the technician the ability to set an unlimited number of event flags to mark selected points in each data stream. The software will provide a Note Pad Window that records the flag, time stamp, and user's notes. The software must create and save a log file of the event flags and notes so the technician can go back to the flagged points in the data steams.

The system will need to be able to record AVI videos of multiple external video feeds and synchronize the videos created to the time stamps of the other collected data streams.

3.4 Hardware and Software

- Components will be solidified during the market survey process.

3.5 User documentation

- The contractor shall develop user documentation to allow AGARS system operators to easily reconfigure the system and to integrate new interface devices.

3.6 Final software products

- The contractor shall deliver all operating system software, application source code, and executable software.

3.7 Final hardware products

- All hardware and computers purchased or developed for this program shall be delivered.

4.0 Sub-Tasks

- Assessment of the current Laboratory recording capabilities
- Installation of the recording system at the CAMI facility in Oklahoma City
    - The contractor shall install developed hardware and software into the AGARS system and demonstrate that the new components accurately function as agreed upon during the design review meeting.
- Evaluation and Acceptance of the Recording System
    - The contractor shall demonstrate the systems capabilities by collecting data of a typical 30 minute flight scenario on AGARS. The project team will provided the simulator based scenario.

5.0 Deliverables

Deliverables	Due Date*
Assessment of the current Laboratory Recording Capabilities	*15 days after award
Installation of Digital Recording System	*60 days after award
Evaluation and Acceptance of Digital Recording System	*60 to 90 days after award
*Final deliverable schedule to be determined once project plan and timeline are established. ** Adjustable – actual schedule will be established following revision of software.	

6.0 Place of Performance

The work shall be performed at the Mike Monroney Aeronautical Center in the Civil Aerospace Institutes' Advanced General Aviation Research Simulator Laboratory. Design Review Meeting performed at Government site.

7.0 Period of Performance

The Project Start (PS) date shall be within 10 days after award. The period of performance is three (3) months after award.

8.0 Travel

All travel, when required, will be billed in accordance with Federal regulations. The Contractor shall submit travel requests to the Contracting Officer's Technical Representative (COTR) for approval of travel at least 1 week in advance of travel.

9.0 Hours of Work

Hours of work are the normal operational hours plus those hours required for scheduled travel. Offerors are expected to conform to customer agency normal operation hours from 8:00am – 5:00pm (CST). Use of overtime is not applicable.

10.0 Acceptance of Deliverables

The Project Team will have ten (10) working days to complete its review of the deliverables. The Project Team will accept or reject the deliverables in writing. In the event of the rejection of any deliverable, the Contractor shall be notified in writing by the COTR, giving the specific reason(s) for rejection. The Contractor shall have five (5) working days to correct the rejected deliverable and return it to the Project Team COTR.

11.0 Expertise Requirements

- The Contractor shall provide personnel with expertise in research-based recording systems. Personnel assigned to this task order must possess professional skills and extensive experience in the area of digital recording applications and systems.
- The Contractor shall provide an engineer with demonstrated experience in:
  - ✓ Developing and evaluating data recording
  - ✓ Utilizing human factors usability guidelines in the development process
  - ✓ Developing comprehensive, practical digital recording applications
  - ✓ Working with clients and others not familiar digital recording capabilities and technologies

12.0 Use of Government Facilities or Personnel

Unless directly related to this Task Order, the Contractor and any employees or consultant of the Contractor are prohibited from using U.S. Government facilities (such as office space or equipment) or U.S. Government clerical or technical personnel in the performance of the services not specified in the Task Order.

13.0 Contracting Officer's Technical Representative (COTR)

The COR/COTR is designated by the Contracting Officer to perform technical liaison between the contractor's management and the Contracting Officer in routine technical matters constituting general program direction within the scope of the contract/task order. Under NO circumstances is the COR/COTR authorized to effect any changes in the work required under this contract/task order whatsoever, or enter into any agreement that has the effect of changing the terms and conditions of this Task Order, or that causes the Contractor to incur any costs.

In addition, the COR/COTR will NOT supervise, direct, or control contractor employees. Notwithstanding this provision, to the extent that contractor accepts any direction that constitutes a change to his contract/task order without prior written authorization of the Contracting Officer, costs incurred in connection therewith are incurred at the sole risk of the contract, and if involved under this Task Order will be disallowed.

On all matters that pertain to the contract terms, the contractor must communicate with the Contracting Officer. Whenever, in the opinion of the contractor, the COR/COTR requests efforts beyond the terms of the contract, the contractor shall so advise the Contracting Officer. If the COR/COTR persists and there still exists a disagreement as to the proper contractual coverage, the Contracting Officer will be notified immediately, preferably in writing.

Proceeding with work without proper contractual coverage may result in nonpayment or necessitate submittal of a contract claim. The prime contractor's management should clearly communicate this position to its employees working on this contract and to any subcontractors also providing support.

14.0 Section 508 Requirements

All electronic and information technology (EIT) procured through this Task Order must meet the applicable accessibility standards at 36 CFR 1194, unless an agency exception to this requirement exists. 36 CFR 1194 implements Section 508 of the Rehabilitation Act of 1973, as amended, and is viewable at http://www/acessboard.gov/sec508/508standards.htm.

The Contractor shall indicate for each line item in the schedule whether each product or service is compliant or non-compliant with the accessibility standards at 36 CFR 1194. Further, the proposal must indicate where full details of compliance can be found (e.g., vendor's Web site or other exact location).